

**WHAT IS CLAIMED IS:**

1. A photodetector having a heterojunction structure in an intrinsic region, comprising:

5           a lower cladding layer including an n-type doped region;  
            an absorbing layer;  
            an upper cladding layer including a p-type doped region; and  
            ohmic electrodes connected to said lower cladding layer and said  
upper cladding layer, respectively

10           wherein said p-type doped region extends into said absorbing layer by  
a predetermined length.

2. The photodetector as claimed in claim 1,

            Wherein a distance between said n-type doped region and said p-type  
15   doped region is 0.6 to 1.2  $\mu\text{m}$ .

3. The photodetector as claimed in claim 1,

            Wherein said absorbing layer has a structure that a quantum well  
barrier and a quantum well layer are alternatively formed, and

20           Said p-type doped region extends into some portion of said quantum  
well barrier.

4. The photodetector as claimed in claim 1,

            wherein said the photodetector is one of a waveguide type PIN

structure photodetector, a travelling wave photodetector, or an avalanche photodetector.